

CLAIMS

1. A semiconductor device configured as having a plurality of semiconductor chips each composed of a semiconductor element and having at least an internal circuit formed therein, characterized in that:

signal lines connecting said internal circuits respectively formed in said plurality of semiconductor chips are connected in an electrically direct manner; and
a first protection circuit preventing said semiconductor elements from being damaged by the connection of said signal lines connecting said internal circuits with each other is provided.

2. The semiconductor device as claimed in Claim 1, characterized in that:

said first protection circuit is disposed, in at least one chip out of said plurality of semiconductor chips, on the signal line between a connection area connected to said internal circuit of the other and said internal circuit of its own.

3. The semiconductor device as claimed in Claim 2, characterized in that:

said first protection circuit is disposed, in every chip out of said plurality of semiconductor chips, on each signal line between a connection area connected to said internal circuit of the other and said internal circuit on the semiconductor chip.

4. The semiconductor device as claimed in Claim 1,

characterized in that:

 said semiconductor chip is provided with an
external connection circuit formed therein, equipped with
a second protection circuit which is electrically
5 connected to said signal line so as to transmit signals
on said signal line to an external instrument, and
protecting said semiconductor element from being damaged
by said connection; and

 said first protection circuit is provided on the
10 signal line connecting said internal circuits with each
other, besides said second protection circuit.

5. The semiconductor device as claimed in Claim 1,
characterized in that:

15 said semiconductor chip is provided with an
external connection circuit formed therein, equipped with
a second protection circuit which is electrically
connected to said signal line so as to transmit signals
on said signal line to an external instrument, and
20 protecting said semiconductor element from being damaged
by said connection; and

 a protection performance of said protection circuit
against said damage differs from a protection performance
of said second protection circuit owned by said external
25 connection circuit.

6. The semiconductor device as claimed in Claim 1,
characterized by having a switching circuit capable of
switching of electrical connection and disconnection, to
30 or from said signal line, of at least a portion of
circuit components composing said first protection

circuit.

7. A method of fabricating a semiconductor device configured as having a plurality of semiconductor chips each composed of a semiconductor element and having at least an internal circuit formed therein, characterized by having:

a connecting step of connecting said individual internal circuits of said plurality of semiconductor chips in an electrically direct manner, each of said plurality of semiconductor chips comprising a protection circuit protecting a semiconductor element in said internal circuit from a damage due to the electrical and direct connection between one internal circuit and the internal circuit on the other semiconductor chip; while activating said protection circuit.

8. A method of fabricating a semiconductor device configured as having a plurality of semiconductor chips each composed of a semiconductor element and having at least an internal circuit formed therein, characterized by having:

an electrode forming step of forming protruded electrodes connecting the individual internal circuits of said plurality of semiconductor chips in an electrically direct manner, each of said plurality of semiconductor chips comprising a protection circuit protecting a semiconductor element in said internal circuit from a damage due to the electrical and direct connection between said internal circuit and the internal circuit on the other semiconductor chip; while keeping said

protection circuit active.

9. The method of fabricating a semiconductor device as claimed in Claim 8, characterized by having a connecting
5 step of connecting the individual internal circuits of said plurality of semiconductor chips in an electrically direct manner, using said protruded electrodes formed in said electrode formation step, while keeping said protection circuit active.

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10. The method of fabricating a semiconductor device as claimed in Claim 7 or 9, characterized by having,
preceding said connection step, an inspecting step of inspecting functions of said internal circuits of said
15 plurality of semiconductor chips, for every semiconductor chip.

11. The method of fabricating a semiconductor device as claimed in Claim 10, characterized in that:

20 said semiconductor chip is provided with an external connection circuit formed therein, electrically connected to a signal line derived from said internal circuit so as to transmit signals on said signal line to an external instrument; and characterized by further
25 having:

 between said inspection step and said connection step, an isolating step of electrically isolating at least a part of said external connection circuit provided corresponding to a target signal line directly connecting
30 said internal circuits.

12. The method of fabricating a semiconductor device as claimed in Claim 10, characterized in that said inspecting step is carried out through said external connection circuit formed on said semiconductor chip.

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13. The method of fabricating a semiconductor device as claimed in Claim 7, characterized by further having, following said connecting step, a separating step of electrically separating at least a part of circuit components composing said protection circuit from the signal line directly connecting said internal circuits.

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